CLAIMS

1.   (currently amended) A method for reducing spurious emissions in an amplified signal by applying pre-distortion, whose magnitude is frequency-dependent, to an input signal to generate a pre-distorted signal, such that, when the pre-distorted signal is applied to an amplifier to generate the amplified signal, the pre-distortion reduces spurious emissions in the amplified signal, wherein the pre-distorted signal is generated by:

    (a)   generating a first frequency-dependent pre-distortion signal corresponding to a first set of frequency components for the input signal;

    (b)   generating a second frequency-dependent pre-distortion signal corresponding to a second set of frequency components for the input signal, wherein the first set of frequency components is different from the second set of frequency components; and

    (c)   combining the first and second frequency-dependent pre-distortion signals to generate the pre-distorted signal, wherein:

    the first set of frequency components corresponds to positive frequency components of the input signal; and

    the second set of frequency components corresponds to negative frequency components of the input signal.

2.   (currently amended) The ~~invention~~ method of claim 1, wherein the phase of the pre-distortion is also frequency-dependent.

3.   (canceled)

4.   (currently amended) ~~(e.g., Fig. 5)~~ The ~~invention~~ method of claim [[3]] 1, wherein:

    the first frequency-dependent pre-distortion signal is generated by:

    (1)   generating a first set of one or more waveforms corresponding to a first set of one or more pre-distortion parameters;

    (2)   differentiating the first set of one or more waveforms with respect to time to generate a first set of one or more differentiated waveforms; and

    (3)   applying the first set of one or more differentiated waveforms to a positive-frequency operation to generate the first frequency-dependent pre-distortion signal; and

    the second frequency-dependent pre-distortion signal is generated by:

    (1)   generating a second set of one or more waveforms corresponding to a second set of one or more pre-distortion parameters;

    (2)   differentiating the second set of one or more waveforms with respect to time to generate a second set of one or more differentiated waveforms; and

    (3)   applying the second set of one or more differentiated waveforms to a negative-frequency operation to generate the second frequency-dependent pre-distortion signal.

5-6.   (canceled)

7.   (currently amended) The ~~invention~~ method of claim 1, further comprising the step of generating a frequency-independent pre-distorted signal from the input signal, wherein the frequency-independent pre-distorted signal and the first and second frequency-dependent pre-distortion signals are combined to generate the pre-distorted signal.

8.   (currently amended) The ~~invention~~ method of claim 1, wherein:

    the input signal is represented in a base-band domain; and

    the first and second frequency-dependent pre-distortion signals are generated in a digital domain.

1   9.   (original) An apparatus for applying pre-distortion to an input signal to generate a pre-
2 distorted signal, such that, when the pre-distorted signal is applied to an amplifier to generate an
3 amplified signal, the pre-distortion reduces spurious emissions in the amplified signal, the apparatus
4 comprising:
5   (a)   a first signal processing path adapted to generate a main pre-distortion signal from the
6 input signal;
7   (b)   a second signal processing path adapted to generate a first frequency-dependent pre-
8 distortion signal corresponding to a first set of frequency components for the input signal;
9   (c)   a third signal processing path adapted to generate a second frequency-dependent pre-
10 distortion signal corresponding to a second set of frequency components for the input signal, wherein the
11 first set of frequency components is different from the second set of frequency components; and
12   (d)   a combiner adapted to combine the first and second frequency-dependent pre-distortion
13 signals with the main pre-distortion signal to generate the pre-distorted signal.

1   10.   (currently amended) ~~(Fig. 5)~~ The ~~invention~~ apparatus of claim 9, wherein:
2 the first set of frequency components corresponds to positive frequency components of the input
3 signal; and
4 the second set of frequency components corresponds to negative frequency components of the
5 input signal.

1   11.   (currently amended) ~~(Fig. 5)~~ The ~~invention~~ apparatus of claim 10, wherein:
2 the first frequency-dependent pre-distortion signal is generated by:
3   (1)   generating a first set of one or more waveforms corresponding to a first set of
4 one or more pre-distortion parameters;
5   (2)   differentiating the first set of one or more waveforms with respect to time to
6 generate a first set of one or more differentiated waveforms; and
7   (3)   applying the first set of one or more differentiated waveforms to a positive-
8 frequency operation to generate the first frequency-dependent pre-distortion signal; and
9 the second frequency-dependent pre-distortion signal is generated by:
10   (1)   generating a second set of one or more waveforms corresponding to a second set
11 of one or more pre-distortion parameters;
12   (2)   differentiating the second set of one or more waveforms with respect to time to
13 generate a second set of one or more differentiated waveforms; and
14   (3)   applying the second set of one or more differentiated waveforms to a negative-
15 frequency operation to generate the second frequency-dependent pre-distortion signal.

1   12.   (currently amended) The ~~invention~~ apparatus of claim 11, wherein the positive- and
2 negative-frequency operations are implemented using filters.

1   13.   (currently amended) ~~(e.g., Figs. 8-9)~~ The ~~invention~~ apparatus of claim 9, wherein:
2 the first set of frequency components corresponds to positive and negative frequency
3 components of the input signal; and
4 the second set of frequency components corresponds to only positive frequency components or
5 only negative frequency components of the input signal.

1   14.   (currently amended) ~~(e.g., Figs. 8-9)~~ The ~~invention~~ apparatus of claim 13, wherein:
2 the first frequency-dependent pre-distortion signal is generated by:
3   (1)   generating a first set of one or more waveforms corresponding to a first set of
4 one or more pre-distortion parameters;

5   (2)   differentiating the first set of one or more waveforms with respect to time to
6 generate the first frequency-dependent pre-distortion signal; and
7   the second frequency-dependent pre-distortion signal is generated by:
8   (1)   generating a second set of one or more waveforms corresponding to a second set
9 of one or more pre-distortion parameters;
10   (2)   differentiating the second set of one or more waveforms with respect to time to
11 generate a second set of one or more differentiated waveforms; and
12   (3)   applying the second set of one or more differentiated waveforms to a negative-
13 frequency operation or a positive-frequency operation to generate the second frequency-dependent pre-
14 distortion signal.

1   15.   (currently amended) The ~~invention~~ apparatus of claim 14, wherein the positive-
2 frequency operation or the negative-frequency operation is implemented using a filter.

1   16.   (currently amended) The ~~invention~~ apparatus of claim 9, wherein:
2   the input signal is represented in a base-band domain; and
3   the main pre-distortion signal and the first and second frequency-dependent pre-distortion
4 signals are generated in a digital domain.

1   17.   (currently amended) The ~~invention~~ apparatus of claim 9, wherein:
2   the first signal processing path comprises:
3   (1)   an index generator adapted to generate index values proportional to envelope
4 power of the input signal;
5   (2)   a first look-up table adapted to provide first and second pre-distortion
6 parameters using the index values; and
7   (3)   a first multiplier adapted to multiply the input signal by the first and second pre-
8 distortion parameters to generate the main pre-distortion signal;
9   the second signal processing path comprises:
10   (1)   a second look-up table adapted to provide third and fourth pre-distortion
11 parameters using the index values;
12   (2)   a second multiplier adapted to multiply the input signal by the third and fourth
13 pre-distortion parameters to generate first multiplied signals; and
14   (3)   a first differentiator adapted to differentiate the first multiplied signals with
15 respect to time to generate first differentiated signals; and
16   the third signal processing path comprises:
17   (1)   a third look-up table adapted to provide fifth and sixth pre-distortion parameters
18 using the index values;
19   (2)   a third multiplier adapted to multiply the input signal by the fifth and sixth pre-
20 distortion parameters to generate second multiplied signals; and
21   (3)   a second differentiator adapted to differentiate the second multiplied signals with
22 respect to time to generate second differentiated signals.

1   18.   (currently amended) ~~(e.g., Fig. 5)~~ The ~~invention~~ apparatus of claim 17, wherein:
2   the second signal processing path further comprises a positive-frequency filter adapted to filter
3 the first differentiated signals to generate the first frequency-dependent predistortion signal; and
4   the third signal processing path further comprises a negative-frequency filter adapted to filter the
5 second differentiated signals to generate the second frequency-dependent predistortion signal.

1   19.   (currently amended) ~~(e.g., Figs. 8-9)~~ The ~~invention~~ apparatus of claim 17, wherein:
2   the first differentiated signals are the first frequency-dependent predistortion signal; and

3   the third signal processing path further comprises either a positive-frequency filter or a negative-
4   frequency filter adapted to filter the second differentiated signals to generate the second frequency-
5   dependent predistortion signal.

1   20.   (new) A method for reducing spurious emissions in an amplified signal by applying pre-
2   distortion, whose magnitude is frequency-dependent, to an input signal to generate a pre-distorted signal,
3   such that, when the pre-distorted signal is applied to an amplifier to generate the amplified signal, the
4   pre-distortion reduces spurious emissions in the amplified signal, wherein the pre-distorted signal is
5   generated by:
6   (a)   generating a first frequency-dependent pre-distortion signal corresponding to a first set
7   of frequency components for the input signal;
8   (b)   generating a second frequency-dependent pre-distortion signal corresponding to a second
9   set of frequency components for the input signal, wherein the first set of frequency components is
10   different from the second set of frequency components; and
11   (c)   combining the first and second frequency-dependent pre-distortion signals to generate
12   the pre-distorted signal, wherein:
13   the first set of frequency components corresponds to positive and negative frequency
14   components of the input signal; and
15   the second set of frequency components corresponds to only positive frequency
16   components or only negative frequency components of the input signal.

1   21.   (new) The method of claim 20, wherein the phase of the pre-distortion is also
2   frequency-dependent.

1   22.   (new) The method of claim 20, wherein:
2   the first frequency-dependent pre-distortion signal is generated by:
3   (1)   generating a first set of one or more waveforms corresponding to a first set of
4   one or more pre-distortion parameters;
5   (2)   differentiating the first set of one or more waveforms with respect to time to
6   generate the first frequency-dependent pre-distortion signal; and
7   the second frequency-dependent pre-distortion signal is generated by:
8   (1)   generating a second set of one or more waveforms corresponding to a second set
9   of one or more pre-distortion parameters;
10   (2)   differentiating the second set of one or more waveforms with respect to time to
11   generate a second set of one or more differentiated waveforms; and
12   (3)   applying the second set of one or more differentiated waveforms to a negative-
13   frequency operation or a positive-frequency operation to generate the second frequency-dependent pre-
14   distortion signal.

1   23.   (new) The method of claim 20, further comprising the step of generating a frequency-
2   independent pre-distorted signal from the input signal, wherein the frequency-independent pre-distorted
3   signal and the first and second frequency-dependent pre-distortion signals are combined to generate the
4   pre-distorted signal.

1   24.   (new) The method of claim 20, wherein:
2   the input signal is represented in a base-band domain; and
3   the first and second frequency-dependent pre-distortion signals are generated in a digital domain.